



## SEQUENCE LISTING

<110> Sturmer, Rainer  
Kessler, Maria  
Hauer, Bernhard  
Friedrich, Thomas  
Breuer, Michael

<120> Methods for the production of  
3-methylamino-1-(thiene-2-yl)-propane-1-ol

<130> 13111-00035-US

<140> US/10/573,130

<141> 2006-03-23

<150> PCT/EP2004/010939

<151> 2004-09-30

<150> DE 103 45 772.0

<151> 2003-10-01

<160> 44

<170> PatentIn version 3.3

<210> 1

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<212> PRT

<213> Lactobacillus brevis

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Leu	Gly	Ile	Gly	Leu	Ala	Ile	Ala	Thr	Lys	Phe	Val	Glu	Glu	Gly	Ala
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<213> Candida magnoliae

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Phe	Ile														

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&lt;213&gt; Lactobacillus brevis

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(756)

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Met Ser Asn Arg Leu Asp Gly Lys Val Ala Ile Val Thr Gly Gly Thr	
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ttg ggt atc ggt tta gct atc gcc acg aag ttc gtt gaa gaa ggg gct	96
Leu Gly Ile Gly Leu Ala Ile Ala Thr Lys Phe Val Glu Glu Gly Ala	
20 25 30	
aag gtc atg att acc ggc cgg cac agc gat gtt ggt gaa aaa gca gct	144
Lys Val Met Ile Thr Gly Arg His Ser Asp Val Gly Glu Lys Ala Ala	
35 40 45	
aag agt gtc ggc act cct gat cag att caa ttt ttc caa cat gat tct	192
Lys Ser Val Gly Thr Pro Asp Gln Ile Gln Phe Phe Gln His Asp Ser	
50 55 60	
tcc gat gaa gac ggc tgg acg aaa tta ttc gat gca acg gaa aaa gcc	240
Ser Asp Glu Asp Gly Trp Thr Lys Leu Phe Asp Ala Thr Glu Lys Ala	
65 70 75 80	
ttt ggc cca gtt tct aca tta gtt aat aac gct ggg atc gcg gtt aac	288
Phe Gly Pro Val Ser Thr Leu Val Asn Asn Ala Gly Ile Ala Val Asn	
85 90 95	
aag agt gtc gaa gaa acc acg act gct gaa tgg cgt aaa cta tta gcc	336
Lys Ser Val Glu Thr Thr Thr Ala Glu Trp Arg Lys Leu Leu Ala	
100 105 110	
gtc aac ctt gat ggt gtc ttc ttc ggt acc cga tta ggg att caa cgg	384
Val Asn Leu Asp Gly Val Phe Phe Gly Thr Arg Leu Gly Ile Gln Arg	
115 120 125	
atg aag aac aaa ggc tta ggg gct tcc atc atc aac atg tct tcg atc	432
Met Lys Asn Lys Gly Leu Gly Ala Ser Ile Ile Asn Met Ser Ser Ile	
130 135 140	
gaa ggc ttt gtg ggt gat cct agc tta ggg gct tac aac gca tct aaa	480
Glu Gly Phe Val Gly Asp Pro Ser Leu Gly Ala Tyr Asn Ala Ser Lys	
145 150 155 160	
ggg gcc gta cgg att atg tcc aag tca gct gcc tta gat tgt gcc cta	528
Gly Ala Val Arg Ile Met Ser Lys Ser Ala Ala Leu Asp Cys Ala Leu	
165 170 175	
aag gac tac gat gtt cgg gta aac act gtt cac cct ggc tac atc aag	576
Lys Asp Tyr Asp Val Arg Val Asn Thr Val His Pro Gly Tyr Ile Lys	
180 185 190	
aca cca ttg gtt gat gac cta cca ggg gcc gaa gaa gcg atg tca caa	624
Thr Pro Leu Val Asp Asp Leu Pro Gly Ala Glu Glu Ala Met Ser Gln	
195 200 205	
cgg acc aag acg cca atg ggc cat atc ggt gaa cct aac gat att gcc	672
Arg Thr Lys Thr Pro Met Gly His Ile Gly Glu Pro Asn Asp Ile Ala	
210 215 220	
tac atc tgt gtt tac ttg gct tct aac gaa tct aaa ttt gca acg ggt	720
Tyr Ile Cys Val Tyr Leu Ala Ser Asn Glu Ser Lys Phe Ala Thr Gly	
225 230 235 240	
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Ser Glu Phe Val Val Asp Gly Gly Tyr Thr Ala Gln	
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 Lys Val Met Ile Thr Gly Arg His Ser Asp Val Gly Glu Lys Ala Ala  
 35 40 45  
 Lys Ser Val Gly Thr Pro Asp Gln Ile Gln Phe Phe Gln His Asp Ser  
 50 55 60  
 Ser Asp Glu Asp Gly Trp Thr Lys Leu Phe Asp Ala Thr Glu Lys Ala  
 65 70 75 80  
 Phe Gly Pro Val Ser Thr Leu Val Asn Asn Ala Gly Ile Ala Val Asn  
 85 90 95  
 Lys Ser Val Glu Glu Thr Thr Thr Ala Glu Trp Arg Lys Leu Leu Ala  
 100 105 110  
 Val Asn Leu Asp Gly Val Phe Phe Gly Thr Arg Leu Gly Ile Gln Arg  
 115 120 125  
 Met Lys Asn Lys Gly Leu Gly Ala Ser Ile Ile Asn Met Ser Ser Ile  
 130 135 140  
 Glu Gly Phe Val Gly Asp Pro Ser Leu Gly Ala Tyr Asn Ala Ser Lys  
 145 150 155 160  
 Gly Ala Val Arg Ile Met Ser Lys Ser Ala Ala Leu Asp Cys Ala Leu  
 165 170 175  
 Lys Asp Tyr Asp Val Arg Val Asn Thr Val His Pro Gly Tyr Ile Lys  
 180 185 190  
 Thr Pro Leu Val Asp Asp Leu Pro Gly Ala Glu Glu Ala Met Ser Gln  
 195 200 205  
 Arg Thr Lys Thr Pro Met Gly His Ile Gly Glu Pro Asn Asp Ile Ala  
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 att aag ctc gcc gag gag ggc tac agc gtc acg att gcg tct cgc ggc 96  
 Ile Lys Leu Ala Glu Glu Gly Tyr Ser Val Thr Ile Ala Ser Arg Gly  
 20 25 30  
 ctt aag cag ctc gag gct gtg aag gcc aaa cta ccc att gtg aag cag 144

Leu	Lys	Gln	Leu	Glu	Ala	Val	Lys	Ala	Lys	Leu	Pro	Ile	Val	Lys	Gln		
		35					40					45					
gga	cag	gtt	cac	cac	gtg	tgg	cag	ctt	gat	ctc	agt	gat	gtc	gac	gct	192	
Gly	Gln	Val	His	His	Val	Trp	Gln	Leu	Asp	Leu	Ser	Asp	Val	Asp	Ala		
		50					55				60						
gcg	gcc	gcc	ttc	aaa	ggg	tcg	ccg	cta	cct	gcc	agc	cgc	tac	gac	gtg	240	
Ala	Ala	Ala	Phe	Lys	Gly	Ser	Pro	Leu	Pro	Ala	Ser	Arg	Tyr	Asp	Val		
65					70					75				80			
ctc	gtc	agc	aat	gct	ggc	gtg	gcc	cag	ttt	agc	ccg	ttc	atc	gag	cat	288	
Leu	Val	Ser	Asn	Ala	Gly	Val	Ala	Gln	Phe	Ser	Pro	Phe	Ile	Glu	His		
				85					90					95			
gcg	aag	cag	gac	tgg	tcg	cag	atg	ctt	gcc	atc	aat	ctg	gcg	gca	ccc	336	
Ala	Lys	Gln	Asp	Trp	Ser	Gln	Met	Leu	Ala	Ile	Asn	Leu	Ala	Ala	Pro		
			100					105					110				
att	gcg	ctg	gcc	cag	aca	ttt	gct	aag	gcc	att	ggc	gac	aag	ccg	cgc	384	
Ile	Ala	Leu	Ala	Gln	Thr	Phe	Ala	Lys	Ala	Ile	Gly	Asp	Lys	Pro	Arg		
		115					120				125						
aac	aca	ccg	gcc	cac	att	gtg	ttt	gtc	tcg	tcg	aac	gtc	tcg	ttg	cga	432	
Asn	Thr	Pro	Ala	His	Ile	Val	Phe	Val	Ser	Ser	Asn	Val	Ser	Leu	Arg		
		130				135					140						
ggc	ttc	ccg	aac	atc	ggc	gtc	aac	tcc	atc	acc	ccc	ggc	a			472	
Gly	Phe	Pro	Asn	Ile	Gly	Val	Asn	Ser	Ile	Thr	Pro	Gly					
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Ile	Lys	Leu	Ala	Glu	Glu	Gly	Tyr	Ser	Val	Thr	Ile	Ala	Ser	Arg	Gly		
		20					25					30					
Leu	Lys	Gln	Leu	Glu	Ala	Val	Lys	Ala	Lys	Leu	Pro	Ile	Val	Lys	Gln		
		35					40					45					
Gly	Gln	Val	His	His	Val	Trp	Gln	Leu	Asp	Leu	Ser	Asp	Val	Asp	Ala		
		50				55					60						
Ala	Ala	Ala	Phe	Lys	Gly	Ser	Pro	Leu	Pro	Ala	Ser	Arg	Tyr	Asp	Val		
65				70						75				80			
Leu	Val	Ser	Asn	Ala	Gly	Val	Ala	Gln	Phe	Ser	Pro	Phe	Ile	Glu	His		
			85						90					95			
Ala	Lys	Gln	Asp	Trp	Ser	Gln	Met	Leu	Ala	Ile	Asn	Leu	Ala	Ala	Pro		
		100						105					110				
Ile	Ala	Leu	Ala	Gln	Thr	Phe	Ala	Lys	Ala	Ile	Gly	Asp	Lys	Pro	Arg		
		115				120					125						
Asn	Thr	Pro	Ala	His	Ile	Val	Phe	Val	Ser	Ser	Asn	Val	Ser	Leu	Arg		
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Ser Thr Thr Ser Asn Ala Leu Val Thr Gly Gly Ser Arg Gly Ile Gly  
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 Ala Ala

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Ile Gly Val Asn Ser Ile Asn Pro Gly  
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Gly	Ile	Gly	Leu	Ala	Ile	Ala	Thr	Lys	Phe	Val	Glu	Glu	Gly	Ala	Lys
			20					25					30		
Val	Met	Ile	Thr	Gly	Arg	His	Ser	Asp	Val	Gly	Glu	Lys	Ala	Xaa	Xaa
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Arg	Arg	Xaa	Xaa												
				20											

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Asp Glu Asp Gly  
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Ser Ala Ala Leu Asp Xaa Ala Leu Lys Xaa Xaa Xaa Xaa Xaa Xaa  
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 Xaa Xaa

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<220>

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Ser Ala Ala Leu Asp Xaa Ala Leu Lys Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
 1 5 10 15  
 Xaa

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<400> 25

Lys	Leu	Leu	Ala	Val	Asn	Leu	Asp	Gly	Val	Phe	Phe	Gly	Thr	Arg	Xaa
1				5					10					15	
Xaa	Xaa	Xaa	Xaa												
				20											

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<400> 26

Xaa	Met	Xaa	Thr	Gly	Arg
1				5	

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 <212> PRT  
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<400> 27

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1				5					10					15	

<210> 28  
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1				5				10					15		
Xaa	Xaa	Xaa	Xaa												
				20											

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<400> 29

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Xaa Xaa Xaa Xaa Xaa Val Xaa Xaa Xaa Xaa Xaa Xaa Xaa Phe Xaa Xaa
1          5          10          15

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Xaa Xaa Xaa Xaa Xaa Glu Xaa Xaa Gln  
                   20                  25

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Xaa Xaa Lys Leu Xaa Ala Val Asn Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
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 Xaa Xaa Xaa Xaa  
                   20

<210> 31  
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Xaa Val Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa
1          5          10          15
Xaa Xaa Xaa Pro
          20

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<400> 32

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1			5				10						15		
Xaa	Xaa	Xaa	Xaa	Met	Ser	Lys	Ser	Ala	Ala	Leu	Asp	Xaa	Xaa		
			20				25					30			

<210> 33  
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 <213> Lactobacillus brevis

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<400> 33

Phe	Val	Val	Asp	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa
1			5				10		

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<213> Lactobacillus brevis

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<220>

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<400> 34

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1

5

10

15

Xaa Xaa Xaa Xaa

20

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 1 5 10

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<220>  
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<400> 36

Xaa Xaa Leu Lys Asp Tyr Asp Val Arg Val Asn Thr Val His Pro Gly  
 1 5 10 15  
 Tyr Ile Lys Thr Pro Leu Val Xaa Asp Leu Pro Gly Ala Xaa  
 20 25 30

<210> 37  
 <211> 15  
 <212> PRT  
 <213> Lactobacillus brevis

<400> 37

Lys Ala Ala Lys Ser Val Gly Thr Pro Asp Gln Ile Gln Phe Phe  
 1 5 10 15

<210> 38  
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 <212> PRT  
 <213> Lactobacillus brevis

<400> 38

Gly Ala Lys Val Met Ile Thr Gly Arg His Ser Asp Val  
 1 5 10

<210> 39  
 <211> 10  
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<400> 39

Xaa Lys Xaa Ala Xaa Xaa Xaa Xaa Phe Val  
 1 5 10

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<400> 40

Xaa Xaa Xaa Xaa Xaa Asn Thr Val His Pro Gly Tyr Ile Xaa Xaa Pro  
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 Leu Val Xaa Xaa Leu Xaa Gly Ala Glu  
                     20                      25

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Trp Xaa Lys Leu Leu Ala Val Asn Leu Asp Gly Val Phe Phe Gly Thr  
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 Arg Leu Gly Ile Gln Arg Met Lys Asn Lys Gly Leu Gly Ala Ser Ile  
                     20                      25                      30  
 Ile Asn Met Ser Ser Ile Xaa Xaa  
                     35                      40

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 <223> Xaa is unknown

<400> 42

Ala	Met	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa
1			5				10				15				
Xaa	Xaa	Xaa	Xaa	Xaa	Arg	Met	Lys	Xaa	Lys	Xaa	Leu	Gly	Ala	Ser	Ile
		20					25					30			
Ile	Asn	Met	Ser	Xaa	Xaa	Xaa	Gly								
	35						40								

<210> 43  
 <211> 15  
 <212> PRT  
 <213> Lactobacillus brevis

<220>  
 <221> misc\_feature



<222> (12)..(15)  
 <223> Xaa is unknown

<400> 43

Ser	Lys	Phe	Ala	Thr	Gly	Ser	Glu	Phe	Val	Val	Xaa	Xaa	Xaa	Xaa
1				5				10					15	

<210> 44  
 <211> 15  
 <212> PRT  
 <213> Lactobacillus brevis

<220>  
 <221> misc\_feature  
 <222> (1)..(1)  
 <223> Xaa is Ser (main residue from sequencing), Ala, Phe, or Val

<220>  
 <221> misc\_feature  
 <222> (4)..(4)  
 <223> Xaa is Ala (main residue from sequencing) or Thr

<220>  
 <221> misc\_feature  
 <222> (5)..(5)  
 <223> Xaa is Thr (main residue from sequencing), Ile, or Pro

<220>  
 <221> misc\_feature  
 <222> (6)..(6)  
 <223> Xaa is Gly (main residue from sequencing), Leu, or Asp

<220>  
 <221> misc\_feature  
 <222> (7)..(7)  
 <223> Xaa is Ser (main residue from sequencing) or Gln

<220>  
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 <222> (8)..(8)  
 <223> Xaa is Glu (main residue from sequencing) or Ile

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 <222> (9)..(9)  
 <223> Xaa is Phe (main residue from sequencing) or Gln

<220>  
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 <222> (11)..(11)  
 <223> Xaa is Val (main residue from sequencing), Leu, or Ser

<220>  
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 <222> (12)..(12)

<223> Xaa is Asp (main residue from sequencing), Gln, or Lys

<220>

<221> misc\_feature

<222> (13)..(15)

<223> Xaa is unknown

<400> 44

Xaa	Lys	Phe	Xaa	Xaa	Xaa	Xaa	Xaa	Xaa	Val	Xaa	Xaa	Xaa	Xaa	Xaa
1			5						10					15